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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,507

09/25/2006

Minoru Akaishi

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7590

08/11/2009

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EXAMINER

KEMMERLE III, RUSSELL J

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

08/11/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No. 10/539,507	Applicant(s) AKAISHI ET AL.	
	Examiner RUSSELL J. KEMMERLE III	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>17 June 2005; 08 June 2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 08 June 2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. Specifically English translations or explanations of the relevance has not been provided for cite numbers 7, 8, 10 and 12. It has been placed in the application file, but the information referred to therein regarding these references has not been considered. Additionally on this IDS cite numbers 1-6 have been lined through since they are identical to the cites on the IDS submitted on 17 June 2005, where they have been marked as considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "a minute amount of non-diamond carbon" in claim 1 is a relative term which renders the claim indefinite. The term "a minute amount" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the

Art Unit: 1791

scope of the invention. One skilled in the art would not know what amount of non-diamond carbon would qualify as a “minute amount”. Claim 2 is rejected based on its dependence from claim 1.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 1791

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by Akaishi (M. Akaishi et al., "Synthesis of fine-grained polycrystalline diamond with carbonate as a sintering agent, 41st High Pressure Seminar (2000), The Japan Society of High Pressure Science and Technology, 2D01, p108) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Akaishi in view of Davies (WO 02/09909).

It should be noted, that claim1 is a product-by-process claims, and as such, determination of patentability is based on the product formed, and is not limited to products formed by the process described. See *In re Thorpe*, 777 F.2d 695, 698; 227 USPQ 964, 966 (Fed. Cir. 1985) ("[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." (Citations omitted))

Akaishi discloses a polycrystalline diamond made from a process substantially similar to that of the current invention, with the exception that Akaishi discloses that use of a sintering aid laminated onto the diamond powder before sintering. Specifically, Akaishi discloses enclosing diamond powder having a grain size of 0-0.5 μm (0-500 nm)

Art Unit: 1791

in a Ta capsule which is then placed in a pressure transmitting medium (such as molten NaCl) and sintered at 7.7 GPa and 2200°C using a modified belt type apparatus (ultrahigh-pressure synthesizing apparatus). Based on the similarities between the process of the current invention and that of Akaishi it is assumed that the process of Akaishi is carried out at thermodynamically stable conditions.

It appears that the product created by Akaishi would be the same as that produced by the current method, as it is not clear what, if any, difference the addition of a sintering aid would make on the final product since sintering aids are typically removed during the firing process.

Additionally, while Akaishi discloses the use of natural diamond powder instead of synthetic as recited by the current claim, this should not have an effect on the final product produced since synthetic diamonds and natural diamonds are essentially identical (a diamond lattice crystal structure of carbon).

While Akaishi does not disclose a minute amount of non-diamond carbon in the body, it is assumed that since the process is essentially the same process as that of the current invention using the same materials that the same product would result, including a minute amount of non-diamond carbon. Akaishi discloses that the bodies had an average Vickers hardness above 70 GPa, which encompasses that currently claimed hardness.

In the alternative, if the addition of a sintering aid does result in a difference in the final body produced, such a body would have been obvious in further view of Davies.

Art Unit: 1791

Davies disclose a method of making a polycrystalline abrasive body, including a polycrystalline diamond body, by forming a compact of particles which are treated at high temperature and pressure to form the body. Specifically Davies disclose that the body may be made from diamond particles having a particle size as small as $0.1\text{ }\mu\text{m}$ (100 nm), and that this lower limit is imposed by the limitations of crushing, and not by the method of the invention (paragraph spanning pages 8-9). Davies further notes that in previous methods where a non-particle matter (i.e., sintering aid) is used it becomes difficult to leach out that matter as grain sizes and porosity decrease (page 1, 3rd paragraph). Davies discloses as a solution to this forming such a polycrystalline body free of second phases such as sintering aids (page 2 last paragraph – page 3 first paragraph).

It would have been obvious to one skilled in the art, at the time of invention by applicant, to have modified the method of Akaishi by not using a sintering aid as taught by Davies. This would have been obvious because Davies discloses that such a process is possible, and removes the need to later leach the second phase out of the body.

Claim 2 is rejected under 35 U.S.C. 103(a) as obvious over Akaishi.

Akaishi discloses a method of making polycrystalline diamond by enclosing diamond powder having a grain size of $0\text{-}0.5\text{ }\mu\text{m}$ (0-500 nm) in a Ta capsule which is then placed in a pressure transmitting medium (such as molten NaCl) and sintered at 7.7 GPa and 2200°C using a modified belt type apparatus (ultrahigh-pressure synthesizing apparatus).

Art Unit: 1791

However, Akaishi discloses the use of natural diamonds, instead of synthetic diamonds as recited in the current claims.

Natural and synthetic diamonds are both known to those skilled in the art to be equivalents since they are the same material (a diamond lattice crystal structure of carbon). Therefore, it would have been obvious to one skilled in the art to substitute one known material for the other to achieve the predictable result of producing a diamond composite sintered body. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL J. KEMMERLE III whose telephone number is (571)272-6509. The examiner can normally be reached on Monday through Thursday, 7:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. J. K./
Examiner, Art Unit 1791
/ Carlos Lopez/
Primary Examiner, Art Unit 1791